SFLC-11OL
COMMUNICATION SPECIFICATION

(Protocol A)

HARDWARE MODEL E

DAIICHI ELECTRONICS CO., LTD.

Content

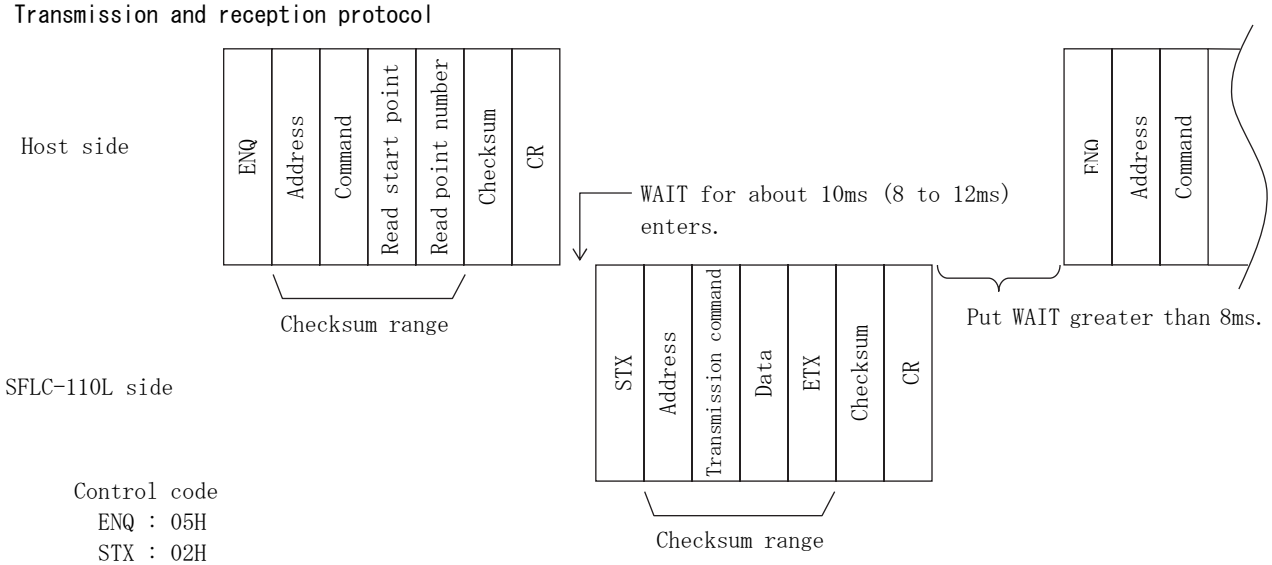
1. Communication specification

Item	Specification	Default setting
Standard	TIA-485-A (2003)	──
Protocol	Protocol A	──
Transmission system	Half-duplex two-wire system	──
Synchronous system	Asynchronous communication method	──
Transmission rate (1)	1200bps / 2400bps / 4800bps / 9600bps / 19200bps	9600bps
Modulation code	NRZ	──
Start bit	1 bit	──
Data length	7 bit / 8 bit	7 bit
Parity (1)	NONE (Nothing) / ODD (Odd number) / EVEN (Even number)	EVEN (Even number)
Stop bit (1)	1 bit / 2 bit	1 bit
Cable length	1000m (The total extension)	──
Address (1)	1 to 254 (Connection is possible to 31 sets.)	1
Error detection	Checksum	──
Transmission character	ASCII code	──

Transmission data are sent out from a bit 0.

Note(1) A setting change is made with a front switch.

2. Transmission and reception protocol



Control code
ENQ : 05H
STX : 02H
ETX : 03H
CR : 0DH

Address

Set the address of 254 stations (excluding 00H, 01H to FEH) for each SFLC-110L.
Data is ASCII cord. (Address set up it in switch operation of SFLC-110L in decimal number.)
If all address data is reset, please give an address as FFH (ASCII code : 46H 46H).

0	A	← Address data 0AH (Front setting : 10)
30H	41H	← Transmission data

3. Command (ASCII 2 digit)

Specifies the transmission response on the SFLC-110L side to the request from the upper side.

Host side request command			SFLC-110L side transmission response		
ASCII		Contents of request	ASCII		Contents of transmission
30H	38H	Settings data	38H	38H	Settings data
30H	41H	Multiplying factor data	38H	41H	Multiplying factor data
32H	30H	All data 1	41H	30H	All data 1
32H	31H	All data 2 (Maximum value, Minimum value)	41H	31H	All data 2 (Maximum value, Minimum value)
35H	34H	Data reset	44H	34H	Data reset OK
35H	35H	All address data reset	—	—	No response
37H	30H	Model code	46H	30H	Model code

4. Checksum

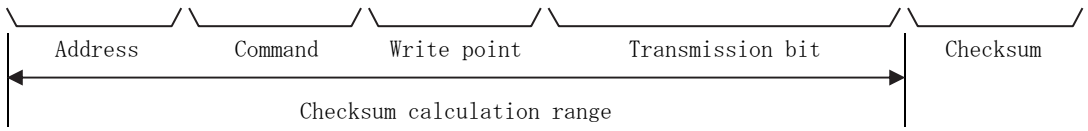
Adds all checksum range characters in ASCII code. Set the low order 8 bit of the answer by the double digits hexadecimal of the ASCII character.

(The example of calculation of a checksum.)

If data reset of address 01H is required.

(1) Host side ⟶ SFLC-110L side

ENQ	0	1	5	4	0	1	0	7	F	F	1	E	CR
05H	30H	31H	35H	34H	30H	31H	30H	37H	46H	46H	31H	45H	0DH

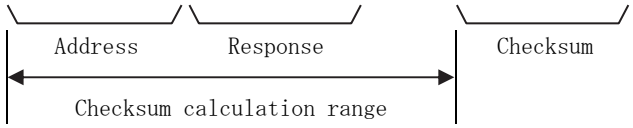


Calculation of checksum

30H + 31H + 35H + 34H + 30H + 31H + 30H + 37H + 46H + 46H ＝ 21E ≠ 1E

(2) SFLC-110L side ⟶ Host side

STX	0	1	D	4	ETX	D	C	CR
02H	30H	31H	44H	34H	03H	44H	43H	0DH



Calculation of checksum

30H + 31H + 44H + 34H + 03H ＝ 0DCH

5. Scaling of measurement data, and the kind of data

(1) Scaling of measurement data.

Item	Input			Communication data	Intrinsic error
Voltage, Minimum・Maximum voltage	3φ3W 1φ2W	AC0 to 150V, AC0 to 300V (Line)		0H to 07D0H (0 to 2000)	±0.5%
	1φ3W (2)	AC0 to 300V (Line)		0H to 07D0H (0 to 2000)	
		AC0 to 150V (Phase)	Phase voltage full scale 150V	0H to 07D0H (0 to 2000)	
			Phase voltage full scale 300V	0H to 03E8H (0 to 1000)	
Current, Minimum・maximum current, Demand current, Minimum・maximum demand current	AC0 to 5A			0H to 07D0H (0 to 2000)	±0.5%
Power, Minimum・maximum power, Demand power, Minimum・maximum demand power	3φ3W 1φ3W	110V	-1kW to 0 to +1kW	0H to 03E8H to 07D0H (0 to 1000 to 2000)	±0.5%
		220V	-2kW to 0 to +2kW		
	1φ2W	110V	-500W to 0 to +500W		
		220V	-1kW to 0 to +1kW		
Reactive power, Minimum・maximum reactive power	3φ3W 1φ3W	110V	LEAD 1kvar to 0 to LAG 1kvar	0H to 03E8H to 07D0H (0 to 1000 to 2000)	±0.5%
		220V	LEAD 2kvar to 0 to LAG 2kvar		
	1φ2W	110V	LEAD 500var to 0 to LAG 500var		
		220V	LEAD 1kvar to 0 to LAG 1kvar		
Power factor, Minimum・maximum power factor	LEAD 0 to 1 to LAG 0			0H to 03E8H to 07D0H (0 to 1000 to 2000)	±2.0%
Frequency, Minimum・maximum frequency	45 to 55Hz			0H to 07D0H (0 to 2000)	±0.5%
	55 to 65Hz				
	45 to 65Hz				
Watt-hour (power receiving・ power transmission)	0 to 99999.9			0 to 999999 (BCD data)	±2.0%
var-hour (Power receiving LAG・LEAD) var-hour (Power transmission LAG・LEAD)	0 to 99999.9			0 to 999999 (BCD data)	±2.5%

Note(2) The phase voltage (V_{RW}, V_{BW}) of single-phase three-wire is maximum of 150V, the communication data at phase voltage full-scale setting 300V is 0H to 03E8H(0 to 1000).
If phase voltage full-scale setting is 150V, communication data is 0H to 07D0H (0 to 2000) in AC0 to 150V.
The default setting of phase voltage full-scale setting is 300V.

(2) The upper limit limiter of measurement data, and a low input cut.

Item	Input			Upper and lower limiter	Low input cut
Voltage, Minimum・Maximum voltage	3φ3W 1φ2W	AC0 to 150V, AC0 to 300V (Line)		101% of full-scale (2020)	Below 0.5% of full-scale (Below 10)
	1φ3W ([3])	AC0 to 300V (Line)		101% of full-scale (1010 or 2020)	0.5% or less of full-scale (Below 5 or 10)
		AC0 to 150V (Phase)	Phase voltage full scale 150V		
			Phase voltage full scale 300V		
Current, Minimum・maximum current, Demand current, Minimum・maximum demand current,	AC0 to 5A			120% of rating (2400)	0.5% or less of rating (Below 10)
Power, Minimum・maximum power, Demand power, Minimum・maximum demand power	3φ3W 1φ3W	110V	-1kW to 0 to +1kW	+120%, -100% of rating (+ side : 2200) (- side : 0)	Below ±0.5% of rating (+ side : 1005 or less) (− side : 995 or more)
		220V	-2kW to 0 to +2kW		
	1φ2W	110V	-500W to 0 to +500W		
		220V	-1kW to 0 to +1kW		
Reactive power, Minimum・maximum reactive power	3φ3W 1φ3W	110V	LEAD 1kvar to 0 to LAG 1kvar	+120%, -100% of rating (LAG side : 2200) (LEAD side : 0)	±0.5% or less of rating (LAG side : 1005 or less) (LEAD side : 995 or more)
		220V	LEAD 2kvar to 0 to LAG 2kvar		
	1φ2W	110V	LEAD 500var to 0 to LAG 500var		
		220V	LEAD 1kvar to 0 to LAG 1kvar		
Power factor, Minimum・maximum power factor	LEAD 0 to 1 to LAG 0			−	20% or less of voltage full scale. 2% or less of rated current.
Frequency, Minimum・maximum frequency	45 to 55Hz			101% of full-scale (2020)	20% or less of voltage full scale (Less than a lower limit is 0.)
	55 to 65Hz				
	45 to 65Hz				

Note([3]) With phase voltage full-scale settings, an upper limiter value and a low input cut value change.

(3) Measurement factor list

Item	Contents		
	3φ3W	1φ3W (4)	1φ2W
Measurement	Voltage (RY, YB, BR)	Voltage (RW, BW, RB)	Voltage
	Maximum voltage (RY, YB, BR)	Maximum voltage (RW, BW, RB)	Maximum voltage
	Minimum voltage (RY, YB, BR)	Minimum voltage (RW, BW, RB)	Minimum voltage
	Current (R, Y, B)	Current (R, B, W)	Current
	Maximum current (R, Y, B)	Maximum current (R, B, W)	Maximum current
	Minimum current (R, Y, B)	Minimum current (R, B, W)	Minimum current
	Demand current (R, Y, B)	Demand current (R, B, W)	Demand current
	Maximum demand current (R, Y, B)	Maximum demand current (R, B, W)	Maximum demand current
	Minimum demand current (R, Y, B)	Minimum demand current (R, B, W)	Minimum demand current
	Power	Power	Power
	Maximum power	Maximum power	Maximum power
	Minimum power	Minimum power	Minimum power
	Demand power	Demand power	Demand power
	Maximum demand power	Maximum demand power	Maximum demand power
	Minimum demand power	Minimum demand power	Minimum demand power
	Reactive power	Reactive power	Reactive power
	Maximum reactive power	Maximum reactive power	Maximum reactive power
	Minimum reactive power	Minimum reactive power	Minimum reactive power
	Power factor	Power factor	Power factor
	Maximum power factor	Maximum power factor	Maximum power factor
	Minimum power factor	Minimum power factor	Minimum power factor
	Frequency	Frequency	Frequency
	Maximum frequency	Maximum frequency	Maximum frequency
	Minimum frequency	Minimum frequency	Minimum frequency
	Watt-hour (Power receiving)	Watt-hour (Power receiving)	Watt-hour (Power receiving)
	Watt-hour (Power transmission)	Watt-hour (Power transmission)	Watt-hour (Power transmission)
	var-hour (Power receiving LAG)	var-hour (Power receiving LAG)	var-hour (Power receiving LAG)
	var-hour (Power receiving LEAD)	var-hour (Power receiving LEAD)	var-hour (Power receiving LEAD)
	var-hour (Power transmission LAG)	var-hour (Power transmission LAG)	var-hour (Power transmission LAG)
	var-hour (Power transmission LEAD)	var-hour (Power transmission LEAD)	var-hour (Power transmission LEAD)

Note(4) In the case of input circuit setting R-W-B.

6. Details of settings data

By transmitting a settings data request command, it transmits the next settings data from the SFLC side.

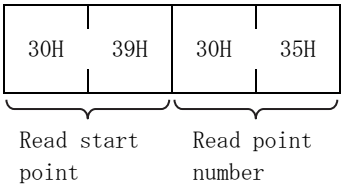
■ Read point list

Read point	Data length	Setting factor		
		3φ3W	1φ3W	1φ2W
01	4 digits	Voltage measurement range (VT ratio)		
02	4 digits	Current measurement range (CT ratio)		
03	4 digits	Frequency measurement range		
04	4 digits	Alarm output, Output factor (5)		
05	4 digits	—		
06	4 digits	Alarm output, Return method (5)		
07	4 digits	Alarm output, Contact delay time (5)		
08	4 digits	—		
09	4 digits	Demand current, Upper limit value		
0A	4 digits	Demand current, Time interval		
0B	4 digits	Demand power, Upper limit value		
0C	4 digits	Demand power, Time interval		
0D	4 digits	Demand power, Operation method		
0E	4 digits	—		
0F	4 digits	—		
10	4 digits	—		
11	4 digits	—		
12	4 digits	—		
13	4 digits	—		
14	4 digits	—		
15	4 digits	—		
16	4 digits	—		
17	4 digits	—		
18	4 digits	—		
19	4 digits	Instantaneous detection, Voltage upper limit value		
1A	4 digits	Instantaneous detection, Voltage lower limit value		
1B	4 digits	—		
1C	4 digits	—		
1D	4 digits	—		
1E	4 digits	—		
1F	4 digits	Tidal current setting		

"—" returns "0000H". (ASCII data, 30H 30H 30H 30H)

Note(5) If they have no option, it returns "0000H" (ASCII data, 30H 30H 30H 30H).

Example) If it requires five data of a demand power operation method from the upper limit value (read point 09H) of demand current, it transmits the next settings data.



■ Setting data details

The parentheses ( ) in the table represent decimal data.

(1) VT ratio

VT ratio data ＝(Primary rating)÷110V

Primary rating (V)	Setting data	Primary rating (V)	Setting data	Primary rating (V)	Setting data
110	0001H (1)	3300	001EH (30)	77k	02BCH (700)
220	0002H (2)	6600	003CH (60)	110k	03E8H (1000)
380 (6)	0003H (3)	11k	0064H (100)	132k	04B0H (1200)
440	0004H (4)	13.2k	0078H (120)	154k	0578H (1400)
460 (6)	0005H (5)	13.8k (7)	007DH (125)	187k	06A4H (1700)
480 (6)	0006H (6)	16.5k	0096H (150)	220k	07D0H (2000)
880	0008H (8)	18.4k (7)	00A7H (167)	275k	09C4H (2500)
1100	000AH (10)	22k	00C8H (200)	380k (7)	0D7FH (3455)
1650	000FH (15)	33k	012CH (300)	550k	1388H (5000)
2200	0014H (20)	66k	0258H (600)		

Note(6) If it divides by 110V, for broken numbers will occur, it becomes intrinsic settings data.

Note(7) It becomes the value which rounded off the broken numbers when dividing by 110V.

(2) CT ratio

CT ratio data ＝(Primary rating)÷5A×10

Primary rating (A)	Setting data	Primary rating (A)	Setting data	Primary rating (A)	Setting data
5	000AH (10)	120	00F0H (240)	2000	0FA0H (4000)
6	000CH (12)	150	012CH (300)	2500	1388H (5000)
7.5	000FH (15)	200	0190H (400)	3000	1770H (6000)
8	0010H (16)	250	01F4H (500)	4000	1F40H (8000)
10	0014H (20)	300	0258H (600)	5000	2710H (10000)
12	0018H (24)	400	0320H (800)	6000	2EE0H (12000)
15	001EH (30)	500	03E8H (1000)	7500	3A98H (15000)
20	0028H (40)	600	04B0H (1200)	8000	3E80H (16000)
25	0032H (50)	750	05DCH (1500)	9000	4650H (18000)
30	003CH (60)	800	0640H (1600)	10000	4E20H (20000)
40	0050H (80)	900	0708H (1800)	12000	5DC0H (24000)
50	0064H (100)	1000	07D0H (2000)	15000	7530H (30000)
60	0078H (120)	1200	0960H (2400)	20000	9C40H (40000)
75	0096H (150)	1500	0BB8H (3000)	30000	EA60H (60000)
80	00A0H (160)	1600	0C80H (3200)		
100	00C8H (200)	1800	0E10H (3600)		

(3) Frequency measurement range

Frequency range	Setting data
45 to 55Hz	0001H (1)
55 to 65Hz	0002H (2)
45 to 65Hz	0003H (3)

(4) Alarm output, Output factor

Communication data	Output contents
0000H	Alarm OFF
0001H	Demand current
0002H	Demand power
000AH	Voltage

The product without an alarm output returns "0000H".
(ASCII data : 30H 30H 30H 30H)

(5) Alarm output, Return method

B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
－	－	－	－	－	－	－	－	－	－	－	－	－	－	－	①

No.	Return factor
①	Alarm

0 : Automatic return
1 : Manual return

The product without an alarm output returns "0000H".
(ASCII data : 30H 30H 30H 30H)

(6) Alarm output, Contact delay time

Contact delay time (second) = Communication data

Contact delay time	Communication data
0 to 300 seconds (1 second Communication data)	0000H to 012CH (0 to 300)

The product without an alarm output returns "0000H".
(ASCII data : 30H 30H 30H 30H)

(7) Demand current, Upper limit value

Demand current, Upper limit value = Communication data

Upper limit value	Communication data
5 to 100% (1% step), OFF	0005H to 0064H (5 to 100), OFF : 0065H (101)

(8) Demand current, Time interval

Demand current, Time interval = Communication data (Unit : second)

Time interval	Communication data	Time interval	Communication data	Time interval	Communication data
0 second	0000H (0)	1 minute	003CH (60)	8 minutes	01E0H (480)
5 seconds	0005H (5)	2 minutes	0078H (120)	9 minutes	021CH (540)
10 seconds	000AH (10)	3 minutes	00B4H (180)	10 minutes	0258H (600)
20 seconds	0014H (20)	4 minutes	00F0H (240)	15 minutes	0384H (900)
30 seconds	001EH (30)	5 minutes	012CH (300)	20 minutes	04B0H (1200)
40 seconds	0028H (40)	6 minutes	0168H (360)	25 minutes	05DCH (1500)
50 seconds	0032H (50)	7 minutes	01A4H (420)	30 minutes	0708H (1800)

(9) Demand power, Upper limit value

Demand power, Upper limit value = Communication data

Upper limit value	Communication data
5 to 100% (1% step), OFF	0005H to 0064H (5 to 100), OFF : 0065H (101)

(10) Demand power, Time interval

Demand power, Time interval = Communication data (Unit : second)

Time interval	Communication data	Time interval	Communication data	Time interval	Communication data
0 second	0000H (0)	1 minute	003CH (60)	8 minutes	01E0H (480)
5 seconds	0005H (5)	2 minutes	0078H (120)	9 minutes	021CH (540)
10 seconds	000AH (10)	3 minutes	00B4H (180)	10 minutes	0258H (600)
20 seconds	0014H (20)	4 minutes	00F0H (240)	15 minutes	0384H (900)
30 seconds	001EH (30)	5 minutes	012CH (300)	20 minutes	04B0H (1200)
40 seconds	0028H (40)	6 minutes	0168H (360)	25 minutes	05DCH (1500)
50 seconds	0032H (50)	7 minutes	01A4H (420)	30 minutes	0708H (1800)

(11) Demand power, Operation method

Operation method	Communication data
Operation method to bimetal type	0001H
Averaging operator within a demand time interval	0002H

(12) Instantaneous detection, Voltage upper limit value

Voltage, Upper limit value = Communication data

Upper limit value	Communication data
30 to 150% (1% step), OFF	001EH to 0096H (30 to 150), OFF : 0097H (151)

(13) Instantaneous detection, Voltage upper limit value

Voltage, Upper limit value = Communication data

Upper limit value	Communication data
30 to 150% (1% step), OFF	OFF : 001DH (29), 001EH to 0096H (30 to 150)

(14) Tidal current measurement

Measurement	Communication data
General measurement	0001H
Tidal current measurement	0002H

7. Multiplying factor data

Read point	Data length	Multiplying factor	Setting data
01	4 digits	×0.01	0005H (30H 30H 30H 35H)
		×0.1	0006H (30H 30H 30H 36H)
		×1	0000H (30H 30H 30H 30H)
		×10	0001H (30H 30H 30H 31H)
		×100	0002H (30H 30H 30H 32H)
		×1000	0003H (30H 30H 30H 33H)
		×10000	0004H (30H 30H 30H 34H)

Read point and read point number is "01H" only.

8. Data reset

Receives a 4-digit ASCII code and resets the data (maximum value / minimum value).

Write point	Data reset		
01	#2	2^7	0
		2^6	0
		2^5	0
		2^4	0
		2^3	0
		2^2	0
		2^1	0
		2^0	0
	#1	2^7	Maximum, minimum, frequency reset
		2^6	Maximum, minimum, power factor reset
		2^5	0
		2^4	Maximum, minimum, Reactive power reset
		2^3	Maximum, minimum, Power reset
		2^2	Maximum, minimum, Voltage reset
		2^1	Maximum, minimum, Current reset
		2^0	Maximum, minimum, Demand value reset

Set 1 for the element to be reset.

<Note> Even if the point of 0 sets data, it does not do data reset. And, it does not reset the factor without relevance with input specification.

9. Model code

By transmitting a model code request command, it transmits the following model code data from the SFLC side.

Item	Data length	Data code	Contents
Series code	2 digits	01H	LC series
Type code	2 digits	06H	SFLC-110L
Specification code 1 (Phase wire code)	2 digits	01H	3φ3W
		02H	1φ3W (R-W-B)
		03H	1φ3W (R-W-Y)
		04H	1φ3W (Y-W-B)
		05H	1φ2W
Specification code 2 (Rated voltage)	2 digits	01H	AC110V
		02H	AC220V

Example) In the case of SFLC-110L 3φ3W rated voltage AC110V, it transmits the following model codes.

30H	31H	30H	36H	30H	31H	30H	31H
Series code		Type code		Specification code 1		Specification code 2	

10. All data

Sends the data of the bit set to 1.

(1) All data 1

Transmission bit		3φ3W	1φ3W	1φ2W	Transmission bit		3φ3W	1φ3W	1φ2W
#6	2^7	0	0	0	#3	2^7	*	*	*
	2^6	0	0	0		2^6	MDA$_B$	MDA$_W$	*
	2^5	0	0	0		2^5	MDA$_Y$	MDA$_B$	*
	2^4	Multiplying factor	Multiplying factor	Multiplying factor		2^4	MDA$_R$	MDA$_R$	MDA
	2^3	0	0	0		2^3	*	*	*
	2^2	0	0	0		2^2	DA$_B$	DA$_W$	*
	2^1	CT ratio	CT ratio	CT ratio		2^1	DA$_Y$	DA$_B$	*
	2^0	VT ratio	VT ratio	VT ratio		2^0	DA$_R$	DA$_R$	DA
#5	2^7	0	0	0	#2	2^7	*	*	*
	2^6	Power transmission LEAD varh	Power transmission LEAD varh	Power transmission LEAD varh		2^6	*	*	*
	2^5	Power transmission LAG varh	Power transmission LAG varh	Power transmission LAG varh		2^5	*	*	*
	2^4	Power transmission Wh	Power transmission Wh	Power transmission Wh		2^4	*	*	*
	2^3	0	0	0		2^3	MDA (8)	MDA (8)	MDA (8)
	2^2	0	0	0		2^2	DA (8)	DA (8)	DA (8)
	2^1	Monitor data	Monitor data	Monitor data		2^1	Hz	Hz	Hz
	2^0	0	0	0		2^0	cos ϕ	cos ϕ	cos ϕ
#4	2^7	0	0	0	#1	2^7	var	var	var
	2^6	*	*	*		2^6	W	W	W
	2^5	MDW	MDW	MDW		2^5	V$_{BR}$	V$_{RB}$	*
	2^4	DW	DW	DW		2^4	V$_{YB}$	V$_{BW}$	*
	2^3	*	*	*		2^3	V$_{RY}$	V$_{RW}$	V
	2^2	Power receiving LEAD varh	Power receiving LEAD varh	Power receiving LEAD varh		2^2	A$_B$	A$_W$	*
	2^1	Power receiving LAG varh	Power receiving LAG varh	Power receiving LAG varh		2^1	A$_Y$	A$_B$	*
	2^0	Power receiving Wh	Power receiving Wh	Power receiving Wh		2^0	A$_R$	A$_R$	A

Note(8) Send the value of the maximum value at that time in each phase. (Except for 1φ2W)

<Note> Only the data of the element specified by the send bit is sent.
(The point without designation does not transmit data.)
Even if 0 is set to 1, no data will be sent. (For reserves)
However, a request of the data of * transmits "0000H" (ASCII code : 30H 30H 30H 30H) as data.

Example) If all the data that can be designated is required.
#6=13H, #5=72H, #4=7FH, #3=FFH, #2=FFH, #1=FFH
Convert this to ASCII code and set the transmit bit as shown below.

#6	#5	#4	#3	#2	#1
31H 33H	37H 32H	37H 46H	46H 46H	46H 46H	46H 46H

■ Integration data

The 6-digit BCD data, and sends it converted to ASCII code.

Scaling of integration data is unnecessary.

	Integration data
kWh (Power receiving)	: Watt-hour (Decimal point single digit)
kvarh (Power receiving LAG)	: Var-hour (Decimal point single digit)
kvarh (Power receiving LEAD)	: Var-hour (Decimal point single digit)
kWh (Power transmission)	: Watt-hour (Decimal point single digit)
kvarh (Power transmission LAG)	: Var-hour (Decimal point single digit)
kvarh (Power transmission LEAD)	: Var-hour (Decimal point single digit)

Scaling of the integration data is done by setting of VT ratio and CT ratio.

Integration data is set to kWh (kvarh) by imposing the following multiplier.

Example) Watt-hour (kWh) ＝ Integration data × Multiplying factor data ＝123.4×100＝12340kWh

■ Monitor data

Monitor the status of alarm contacts.

(If there is no alarm output option, it will be "0000H" (ASCII code: 30H 30H 30H 30H).)

Factor	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Status	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Alarm

0 : Alarm contact OFF

1 : Alarm contact ON

(2) All data 2 (Maximum value and minimum value)

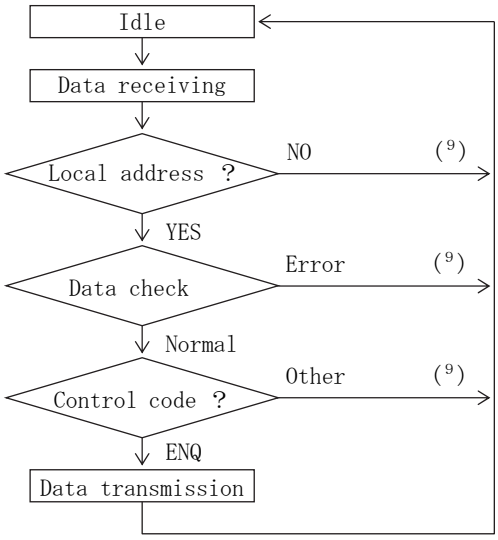
Transmission bit		3φ3W	1φ3W	1φ2W	Transmission bit		3φ3W	1φ3W	1φ2W
#6	2^7	CT ratio	CT ratio	CT ratio	#3	2^7	0	0	0
	2^6	VT ratio	VT ratio	VT ratio		2^6	0	0	0
	2^5	0	0	0		2^5	0	0	0
	2^4	Minimum DW	Minimum DW	Minimum DW		2^4	Maximum DW	Maximum DW	Maximum DW
	2^3	*	*	*		2^3	*	*	*
	2^2	Minimum DA_B	Minimum DA_W	*		2^2	Maximum DA_B	Maximum DA_W	*
	2^1	Minimum DA_Y	Minimum DA_B	*		2^1	Maximum DA_Y	Maximum DA_B	*
	2^0	Minimum DA_R	Minimum DA_R	Minimum DA		2^0	Maximum DA_R	Maximum DA_R	Maximum DA
#5	2^7	*	*	*	#2	2^7	*	*	*
	2^6	*	*	*		2^6	*	*	*
	2^5	*	*	*		2^5	*	*	*
	2^4	*	*	*		2^4	*	*	*
	2^3	0	0	0		2^3	*	*	*
	2^2	*	*	*		2^2	*	*	*
	2^1	Minimum Hz	Minimum Hz	Minimum Hz		2^1	Maximum Hz	Maximum Hz	Maximum Hz
	2^0	Minimum cos ϕ	Minimum cos ϕ	Minimum cos ϕ		2^0	Maximum cos ϕ	Maximum cos ϕ	Maximum cos ϕ
#4	2^7	Minimum var	Minimum var	Minimum var	#1	2^7	Maximum var	Maximum var	Maximum var
	2^6	Minimum W	Minimum W	Minimum W		2^6	Maximum W	Maximum W	Maximum W
	2^5	Minimum V_{BR}	Minimum V_{RB}	*		2^5	Maximum V_{BR}	Maximum V_{RB}	*
	2^4	Minimum V_{YB}	Minimum V_{BW}	*		2^4	Maximum V_{YB}	Maximum V_{BW}	*
	2^3	Minimum V_{RY}	Minimum V_{RW}	Minimum V		2^3	Maximum V_{RY}	Maximum V_{RW}	Maximum V
	2^2	Minimum A_B	Minimum A_W	*		2^2	Maximum A_B	Maximum A_W	*
	2^1	Minimum A_Y	Minimum A_B	*		2^1	Maximum A_Y	Maximum A_B	*
	2^0	Minimum A_R	Minimum A_R	Minimum A		2^0	Maximum A_R	Maximum A_R	Maximum A

<Note> Only the data of the element specified by the send bit is sent.
(The point without designation does not transmit data.)
Even if 0 is set to 1, no data will be sent. (For reserves)
However, a request of the data of * transmits "0000H" (ASCII code : 30H 30H 30H 30H) as data.

Example) If all the data that can be designated is required.
#6=DFH, #5=F7H, #4=FFH, #3=1FH, #2=FFH, #1=FFH
Convert this to ASCII code and set the transmit bit as shown below.

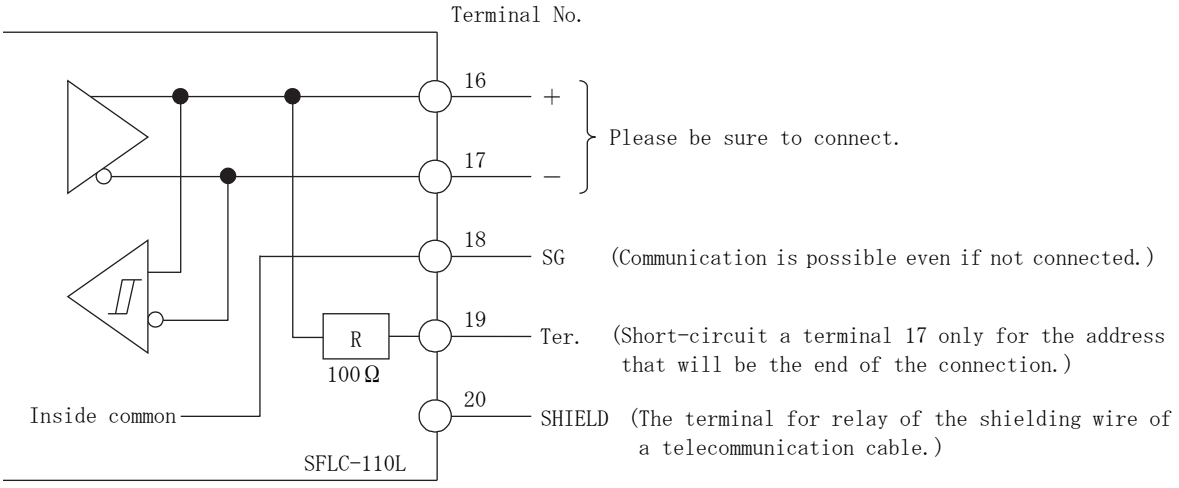
#6		#5		#4		#3		#2		#1	
44H	46H	46H	37H	46H	46H	31H	46H	46H	46H	46H	46H

11. Communication procedure of SFLC-110L communication



Note(9) Address mismatch
Data abnormal
Control code mismatch
} In no cases of an error, it transmits.
Please transmit a demand command again.

12. Terminal arrangement of SFLC-110L communication



(Termination resistor is connected by short-circuiting terminals 17 and 19.)

13. Frame details (Settings data)

Host side ⟶ SFLC-110L

1	2	3	4	5	6	7	8	9	10	11	12
ENQ	Address		0	8	Read start point		Read point number		Checksum		CR

Please refer to settings data and a read point list (7 pages).

SFLC-110L ⟶ Host side

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
STX	Address		8	8	VT ratio				CT ratio				Frequency range			

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Alarm output factor				0	0	0	0	Alarm return method				Alarm contact delay time			

34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
0	0	0	0	Demand current, Upper limit value				Demand current, Time interval				Demand power, Upper limit value			

50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Demand power, Time interval				Demand power, Operation method				0	0	0	0	0	0	0	0

66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113
0	0	0	0	Instantaneous detection, Voltage upper limit value				Instantaneous detection, Voltage lower limit value				0	0	0	0

114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129
0	0	0	0	0	0	0	0	0	0	0	0	Tidal current measurement			

130	131	132	133
ETX	Checksum		CR

14. Frame details (Multiplying factor data)

Host side ⟶ SFLC-110L

1	2	3	4	5	6	7	8	9	10	11	12
ENQ	Address		0	A	Read start point		Read point number		Checksum		CR
					0	1	0	1			

SFLC-110L ⟶ Host side

1	2	3	4	5	6	7	8	9	10	11	12	13
STX	Address		8	A	Multiplying factor				ETX	Checksum		CR

15. Frame details (Data reset)

Host side ⟶ SFLC-110L

1	2	3	4	5	6	7	8	9	10	11	12	13	14
ENQ	Address		5	4	Write point		Data reset ＃2		＃1		Checksum		CR
					0	1							

SFLC-110L ⟶ Host side

1	2	3	4	5	6	7	8	9
STX	Address		D	4	ETX	Checksum		CR

16. Frame details (All address data reset)

Host side ⟶ SFLC-110L

1	2	3	4	5	6	7	8	9	10	11	12	13	14
ENQ	Address		5	5	Write point		Data reset ＃2		＃1		Checksum		CR

The response to this command does not occur. (No response)

<Cautions> Please refer to (the 10 pages) for data reset.

<Cautions> Please give an address as all address designations (FFH).

17. Frame details (Model code)

Host side ⟶ SFLC-110L

1	2	3	4	5	6	7	8
ENQ	Address		7	0	Checksum		CR

SFLC-110L ⟶ Host side

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
STX	Address		F	0	Series code		Type code		Specification code 1		Specification code 2		ETX	Checksum		CR

18. Frame details, All data 1 (General measurement) <In case of three-phase three-wire>

Host side → SFLC-110L

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ENQ	Address		2	0	#6		#5		#4		#3		#2		#1		Checksum		CR
					1	3	7	2	7	F			F	F	F	F			

Only the data specified by the send bit (see page 11) is sent.

SFLC-110L ⟶ Host side

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
STX	Address		A	0	A_R R phase current				A_Y Y phase current				A_B B phase current			

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
V_{RY} RY line voltage				V_{YB} YB line voltage				V_{BR} BR line voltage				W power			

34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
var Reactive power				$\cos\phi$ Power factor				Hz Frequency				DA : Demand current (Maximum value of each phase)			

50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
MDA : Maximum demand current (Maximum value of each phase)				0	0	0	0	0	0	0	0	0	0	0	0

66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
0	0	0	0	DA_R R phase demand current				DA_Y Y phase demand current				DA_B B phase demand current			

82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
0	0	0	0	MDA_R R phase maximum demand current				MDA_Y Y phase maximum demand current				MDA_B B phase maximum demand current			

98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113
0	0	0	0	Wh (Power receiving)						varh (Power receiving LAG)					

114	115	116	117	118	119	120	121	122	123	124	125	126	127
varh (Power receiving LEAD)						0	0	0	0	DW Demand power			

128	129	130	131	132	133	134	135	136	137	138	139	140	141
MDW Maximum demand power				0	0	0	0	Monitor data				Wh (Power transmission)	

142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157
Wh (Power transmission)				varh (Power transmission LAG)						varh (Power transmission LEAD)					

158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173
VT ratio				CT ratio				Multiplying factor				ETX	Checksum		CR

19. Frame details, All data 2 (Maximum, minimum value) <In case of three-phase three-wire>

Host side → SFLC-110L

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ENQ	Address		2	1	#6		#5		#4		#3		#2		#1		Checksum		CR
					D	F	F	7	F	F	1	F	F	F	F	F			

Only the data specified by the send bit (see page 13) is sent.

SFLC-110L ⟶ Host side

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
STX	Address		A	1	A_R [MAX] R phase maximum current				A_Y [MAX] Y phase maximum current				A_B [MAX] B phase maximum current			

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
V_{RY} [MAX] RY line maximum voltage				V_{YB} [MAX] YB line maximum voltage				V_{BR} [MAX] BR line maximum voltage				W [MAX] Maximum power			

34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
var [MAX] Maximum reactive power				cos ϕ [MAX] Maximum power factor				Hz [MAX] Maximum frequency				0	0	0	0

50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
0	0	0	0	MDA_R R phase maximum demand current				MDA_Y Y phase maximum demand current				MDA_B B phase maximum demand current			

82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
0	0	0	0	MDW Maximum demand power				A_R [MIN] R phase minimum current				A_Y [MIN] Y phase minimum current			

98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113
A_B [MIN] B phase minimum current				V_{RY} [MIN] RY line minimum voltage				V_{YB} [MIN] YB line minimum voltage				V_{BR} [MIN] BR line minimum voltage			

114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129
W [MIN] Minimum power				var [MIN] Minimun reactive power				cos ϕ [MIN] Minimum power factor				Hz [MIN] Minimum frequency			

130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161
0	0	0	0	DA_R [MIN] R phase minimum demand current				DA_Y [MIN] Y phase minimum demand current				DA_B [MIN] B phase minimum demand current			

162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177
0	0	0	0	DW [MIN] Minimum demand power				VT ratio				CT ratio			

178	179	180	181
ETX	Checksum		CR

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